

REMARKS

Claims 1-23 are currently pending in the present application, with Claims 1, 2, 4, 7, and 11-13 being amended, and Claims 14-23 being added. Reconsideration and reexamination of the claims are respectfully requested.

The Examiner objected to the Abstract of the disclosure as containing a grammatical error. Applicants have amended the Abstract to correct the error.

The Examiner rejected Claims 1-13 under 35 U.S.C. Sec. 102(b) as being anticipated by Suzuki et al. This rejection is respectfully traversed with respect to the amended claims.

The present invention is directed to a system and method for generating waveforms, processing performance data, and recording waveforms using characteristic properties of the musical tones. More specifically, the present invention is directed to a method for storing musical note performances, or partial waveforms, in accordance with certain property characteristics such as pitch, tone length, or the intensity of the tone being performed (see p.20 of the present application). In particular, while an automatic performance of a musical piece takes place, such as shown in Figs. 3A and 3B, a performer, such as a pianist, simultaneously performs the musical piece in a desired style of rendition. The characteristic properties of the performed musical notes are then detected and stored, and used to designate the corresponding partial waveforms also stored from the performance. Characteristic properties for the same note may be different depending on the performer's style of rendition or where a particular note is placed within a performance phrase.

Once a partial waveform and its characteristic properties are stored from a performance, the corresponding partial waveform data can later be retrieved to generate or reproduce the partial waveform by detecting the same or similar characteristic properties from a performance. More specifically, in response to a user who, for instance, operates an electronic musical instrument such as an electronic keyboard, the present invention detects the characteristic properties of the musical notes performed and retrieves the partial waveform data having the most similar characteristic properties. By using partial waveforms having similar property

characteristics to generate a waveform, the present invention provides more faithful reproduction of a musical performance to correspond with a user's particular style of rendition.

Suzuki et al. does not contain any disclosure or suggestion of storing partial waveform data in accordance with, or designated by, the characteristic properties of the partial waveform. More importantly, Suzuki does not teach or suggest detecting property characteristics of a musical note and using such characteristics to generate waveforms. Rather, Suzuki teaches sampling a live performance and analyzing the sampled waveforms to extrapolate certain articulations of the performance. The musical phrases of the live performance are categorized as under a certain articulation or style of rendition, and can later be reproduced in response to a user designating the performance to be a certain articulation or style of rendition (See Col. 19, lines 27-35). Once the articulation or style of rendition is designated by the user in advance of the performance, waveforms corresponding to the designated articulation or style of rendition are then accessed and retrieved to generate waveforms from subsequent performance. No mention is made whatsoever of detecting characteristic properties of a performance and using the detected characteristic properties to generate partial waveforms.

In particular, with respect to Claim 1, Suzuki does not contain any disclosure or suggestion of detecting a partial waveform having property information corresponding to inputted sounding control information (e.g., performance information) by referring to the property information memory. With respect to Claim 2, Suzuki does not teach or suggest comparing characteristics of notes included in performance data with the property information stored in the property information memory in order to detect an optimum partial waveform having similar property characteristics.

With respect to Claims 4 and 7, Suzuki does not contain any disclosure or suggestion of generating accompanying tones by automatic performance while generating waveforms according to performance events that are performed synchronously with the automatic performance (see Figs. 3A and 3B). Rather, Suzuki simply teaches sampling the waveform data from an actual performance and analyzing the waveforms thereafter.

With respect to Claims 11-13, Suzuki does not teach or suggest a detecting device that retrieves partial waveform data from a database using information on respective performance event data generated from a user performance or have otherwise occurred. Again, Suzuki teaches designating a style of rendition or articulation in advance of musical performance. Accordingly, Applicants respectfully submit that amended Claims 1-13 are not anticipated by, or obvious in view of, Suzuki et al.

In view of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. Reconsideration and reexamination of the claims, as amended, are respectfully requested, and an early allowance is solicited. If the Examiner believes it would further advance the prosecution of the present application, he is respectfully requested to contact the undersigned attorney.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant(s) petition(s) for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 39303.20306.00.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The Abstract has been amended in the following manner:

A waveform generating method is provided, which is capable of generating expressive musical tones. A plurality of partial waveforms are stored in a partial waveform memory. Property information on respective ones of the partial waveforms stored in the partial waveform memory is stored in a property information memory. The property information [memory] is [retrived] retrieved according to inputted sounding control information in order to read out a partial waveform having property information corresponding to the sounding control information. The readout partial waveform is then processed according to the property information and the sounding control information[,] to generate a waveform corresponding to the sounding control information.

In the Claims:

Claims 1, 2, 4, 7, and 11-13 have been amended in the following manner:

1. (Amended) A waveform generating method comprising the steps of:

storing a plurality of partial waveforms in a partial waveform memory;

storing property information on respective ones of the partial waveforms stored in the partial waveform memory, in a property information memory, the property information being indicative of at least one characteristic of performance relating to a corresponding one of the partial waveforms that is included in a phrase, the characteristic being obtained by actual performance of the phrase;

[retrieving the property information memory according to inputted sounding control information to read out] detecting a partial waveform having property information corresponding to [the] inputted sounding control information by referring to the property information memory according to the inputted sounding control information, and reading out the detected partial waveform from the partial waveform memory ;

processing the readout partial waveform according to the property information and the sounding control information; and

generating a waveform corresponding to the sounding control information.

2. (Amended) A performance data processing method comprising the steps of:

storing property information on respective ones of a plurality of partial waveforms in a property information memory, the property information being indicative of at least one characteristic of performance relating to a corresponding one of the partial waveforms that is included in a phrase, the characteristic being obtained by actual performance of the phrase;

comparing characteristics of respective ones of notes included in performance data with the property information stored in the property information memory to detect an optimum partial waveform for a characteristic of each of the notes;

assigning designation data for designating the detected partial waveform to each of the notes; and

storing performance data having the designation data assigned thereto.

4. (Amended) A waveform generating method comprising the steps of:
storing performance information corresponding to real-time performance; [and]
generating accompanying tones by automatic performance or automatic accompaniment
according to a tempo clock[,];
reproducing the stored performance information according to the tempo clock[,]; and
generating waveforms [corresponding] according to performance events, which are
performed in real time [to accompaniment of the generated] synchronously with the
accompanying tones[, according to the performance events] and the reproduced performance
information.

7. (Amended) A waveform data recording apparatus comprising:

an automatic performing device that reproduces tones based on performance data comprising a plurality of notes relating to [phrases] a phrase to be recorded;

a waveform recording device that records a phrase waveform performed simultaneously with the reproduced tones; [waveforms representing tones generated by performance based on tones generated by reproduction of the performance data by said automatic performing device; and]

a waveform data processing device that divides the phrase waveform into partial waveform data according to a characteristic of each of the notes in performance data [extracts data of the phrase waveforms recorded by said waveform recording device according to characteristic information on notes of the performance data to divide the data of the phrase waveforms into partial waveform data corresponding to respective ones of the notes].

11. (Amended) A recorded waveform data reproducing apparatus comprising:

a storage device that stores a tone color set from a partial waveform pool in which selected partial waveform data selected from the partial waveform data is pooled, and a partial waveform management database composed of property information assigned to respective ones of the selected partial waveform data pooled in the partial waveform pool;

a detecting device that retrieves data from the partial waveform management database in the tone color set [according to] by characteristic information on respective notes in performance data to detect optimum partial waveform data for each of the notes from the partial waveform pool;

a designation data inserting device that embeds designation data for designating the optimum partial waveform data detected by said detecting device to each of the notes into the performance data; and

a reproducing device that automatically reproduces the performance data in which the designation data is embedded by said designation data inserting device, according to the optimum partial waveform data designated by the designation data.

12. (Amended) A recorded waveform data reproducing apparatus comprising:

a storage device that stores a tone color set from a partial waveform pool in which selected partial waveform data selected from the partial waveform data is pooled, and a partial waveform management database composed of property information assigned to respective ones of the selected partial waveform data pooled in the partial waveform pool;

a detecting device that retrieves data from the partial waveform management database in the tone color set [according to] by information on respective performance event data that have occurred, to detect optimum partial waveform data for each of the performance event data from the partial waveform pool; and

a reproducing device that reproduces the performance event data according to the optimum partial waveform data detected by said detecting device.

13. (Amended) A recorded waveform data reproducing apparatus comprising:

a storage device that stores a tone color set from a partial waveform pool in which selected partial waveform data selected from the partial waveform data is pooled, and a partial waveform management database composed of property information assigned to respective ones of the selected partial waveform data pooled in the partial waveform pool;

a detecting device that retrieves data from the partial waveform management database in the tone color set [according to] by characteristic information on respective notes in performance data read in advance to detect optimum partial waveform data for each of the notes from the partial waveform pool; and

a reproducing device that is responsive to occurrence of performance event data corresponding to respective ones of the notes in the performance data, for reproducing performance tones corresponding to the respective ones of the notes according to the optimum partial waveform data detected by said detecting device.